

WE CLAIM:

1. A disk drive comprising:

(a) a disk surface, wherein:

the disk surface comprises a plurality of concentric, radially spaced tracks;

each track comprises a plurality of data sectors and a plurality of servo sectors;

the plurality of servo sectors comprise a first index servo sector, a second index servo

sector, and at least one non-index servo sector between the first and second index

servo sectors;

a first index mark identifies the first index servo sector and a second index mark

identifies the second index servo sector;

the first index mark is different than the second index mark;

(b) a head actuated over the disk surface; and

(c) a disk controller for:

maintaining a servo sector counter that identifies the circumferential location of the

servo sectors;

detecting one of the first and second index marks; and

initializing the servo sector counter relative to which index mark is detected.

2. The disk drive as recited in claim 1, wherein:

(a) the disk controller detects a loss of synchronization to the servo sectors by detecting

one of the first and second index marks at the wrong time; and

(b) re-initializes the servo sector counter if loss of synchronization is detected.

- 1 3. The disk drive as recited in claim 1, further comprising a first head actuated over a first
2 disk surface and a second head actuated over a second disk surface, wherein the disk
3 controller for:
4 (a) performing a head switch operation to switch from the first head as the active head to
5 the second head as the active head; and
6 (b) detecting one of the first and second index marks recorded on the second disk surface
7 after performing the head switch operation.
- 1 4. The disk drive as recited in claim 1, wherein each servo sector comprises an index mark
2 field for storing a plurality of bits for recording one out of a group consisting of the first
3 index mark, the second index mark, and a non-index mark.
- 1 5. The disk drive as recited in claim 1, wherein:
2 (a) a first plurality of servo sectors comprise information for identifying the first index
3 mark; and
4 (b) a second plurality of servo sectors comprise information for identifying the second
5 index mark.
- 1 6. The disk drive as recited in claim 5, wherein:
2 (a) the first plurality of servo sectors does not include the first index servo sector; and
3 (b) the second plurality of the servo sectors does not include the second index servo
4 sector.
- 1 7. The disk drive as recited in claim 5, wherein:
2 (a) each of the first plurality of servo sectors comprise at least one bit of the first index
3 mark; and
4 (b) each of the second plurality of the servo sectors comprise at least one bit of the
5 second index mark.

1 8. The disk drive as recited in claim 7, wherein:

- 2 (a) each servo sector comprises a sync mark field for synchronizing to a servo data field,
3 wherein the sync mark field stores one of a first and second sync mark;
4 (b) the first sync mark is different than the second sync mark;
5 (c) the sync mark field in each of the first plurality of servo sectors identifies one bit of
6 the first index mark; and
7 (d) the sync mark field in each of the second plurality of the servo sectors identifies one
8 bit of the second index mark.

1 9. The disk drive as recited in claim 7, wherein:

- 2 (a) the first and second index marks comprise a sequence of index bits that satisfy a run
3 length limit (RLL) constraint; and
4 (b) a plurality of non-index servo sectors between the first and second index servo sectors
5 comprise a sequence of non-index bits that violate the RLL constraint.

1 10. The disk drive as recited in claim 1, wherein the first and second index marks are fault
2 tolerant.

1 11. The disk drive as recited in claim 1, wherein the first and second index marks comprise
2 redundancy bits for distinguishing between the first and second index marks.

1 12. A method of operating disk drive, the disk drive comprises a disk surface having a
2 plurality of concentric, radially spaced tracks, wherein each track comprises a plurality of
3 data sectors and a plurality of servo sectors, the plurality of servo sectors comprise a first
4 index servo sector, a second index servo sector, and at least one non-index servo sector
5 between the first and second index servo sectors, a first index mark identifies the first
6 index servo sector and a second index mark identifies the second index servo sector, and
7 the first index mark is different than the second index mark, the method comprises the
8 steps of:

- 9 (a) maintaining a servo sector counter that identifies the circumferential location of the
10 servo sectors;
11 (b) detecting one of the first and second index marks; and
12 (c) initializing the servo sector counter relative to which index mark is detected.

1 13. The method as recited in claim 12, further comprising the steps of:

- 2 (a) detecting a loss of synchronization to the servo sectors by detecting one of the first
3 and second index marks at the wrong time; and
4 (b) re-initializing the servo sector counter if loss of synchronization is detected.

1 14. The method as recited in claim 12, wherein the disk drive further comprising a first head
2 actuated over a first disk surface and a second head actuated over a second disk surface,
3 further comprising the steps of:

- 4 (a) performing a head switch operation to switch from the first head as the active head to
5 the second head as the active head; and
6 (b) detecting one of the first and second index marks recorded on the second disk surface
7 after performing the head switch operation.

1 15. The method as recited in claim 12, wherein each servo sector comprises an index mark
2 field for storing a plurality of bits for recording one out of a group consisting of the first

index mark, the second index mark, and a non-index mark.

16. The method as recited in claim 12, wherein:

- (a) a first plurality of servo sectors comprise information for identifying the first index mark; and
- (b) a second plurality of servo sectors comprise information for identifying the second index mark.

17. The method as recited in claim 16, wherein:

- (a) the first plurality of servo sectors does not include the first index servo sector; and
- (b) the second plurality of the servo sectors does not include the second index servo sector.

18. The method as recited in claim 16, wherein:

- (a) each of the first plurality of servo sectors comprise at least one bit of the first index mark; and
- (b) each of the second plurality of the servo sectors comprise at least one bit of the second index mark.

19. The method as recited in claim 18, wherein:

- (a) each servo sector comprises a sync mark field for synchronizing to a servo data field, wherein the sync mark field stores one of a first and second sync mark;
- (b) the first sync mark is different than the second sync mark;
- (c) the sync mark field in each of the first plurality of servo sectors identifies one bit of the first index mark; and
- (d) the sync mark field in each of the second plurality of the servo sectors identifies one bit of the second index mark.

- 1 20. The method as recited in claim 18, wherein:
2 (a) the first and second index marks comprise a sequence of index bits that satisfy a run
3 length limit (RLL) constraint; and
4 (b) a plurality of non-index servo sectors between the first and second index servo sectors
5 comprise a sequence of non-index bits that violate the RLL constraint.
- 1 21. The method as recited in claim 12, wherein the first and second index marks are fault
2 tolerant.
- 1 22. The method as recited in claim 12, wherein the first and second index marks comprise
2 redundancy bits for distinguishing between the first and second index marks.